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动物分类学报

中国大巴山蚊蝎蛉属一新种 (长翅目, 蚊蝎蛉科)

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摘 要 记述采自中国大巴山的蚊蝎蛉属1新种, 周氏蚊蝎蛉 *Bittacus choui* sp. nov., 模式标本保存于西北农林科技大学昆虫博物馆, 并通过人工饲养获得卵、幼虫和蛹等所有虫态, 提供了成虫、卵、幼虫和蛹等虫态照片, 绘制了雌雄外生殖器特征图, 简要报道了新种的生物学和生活史。

关键词 长翅目, 蚊蝎蛉科, 蚊蝎蛉属, 生物学, 新种, 中国.
中图分类号 Q969.39

蚊蝎蛉属 *Bittacus* Latreille, 1805 世界性分布, 迄今全球已记载128种, 中国23种, 其中大陆18种 (Huang and Hua, 2005)。2005年, 我们在陕西汉中大巴山区黎坪国家森林公园进行蚊蝎蛉科昆虫区系调查及其生物学研究时, 发现蚊蝎蛉属1新种, 并通过饲养得到卵、幼虫和蛹等所有虫态, 还通过电镜观察了卵的超微形态。

周氏蚊蝎蛉, 新种 Bittacus choui sp. nov. (图1~20)

雄虫 (图1) 翅展33 mm, 体长11 mm。体呈棕黑色。触角19节, 触角、头顶和喙浅褐色, 复眼黑褐色, 单眼三角区棕黑色。前胸背板背面棕褐色, 背板前缘两侧各有1根黑色刚毛; 中胸背板前半部两侧棕褐色, 仅背中线及后半部浅黄色; 胸部侧面和腹面浅黄色, 足基节窝后缘有1黑纹; 足浅黄色, 但腿节前缘有1黑纹, 腿节、胫节末端颜色明显变暗, 胫节末端2距长度差别不大; 腹部膜质区浅黄色, 背板和腹板1~4节黄至暗褐色, 颜色逐节加深, 4节以后逐渐由暗褐色变为黑色, 第8节后缘中部有"V"形缺刻。翅透明, 微泛淡黄色, 无斑纹。前翅长16 mm, 宽3.9 mm, 翅痣明显, 仅1条痣后横脉 (Pcv), 亚前缘横脉 (Scv) 位于Rs脉起点 (ORs) 和Rs第1分叉点 (FRs) 之间, 中脉 (M) 的第1分叉点 (FM) 处为明脉, 透明圆斑界限不明显, 肘横脉 (Cuv) 稍前于M脉分叉点, CuP与1A之间无横脉, 1A脉终点远在M脉分叉点之前, 1A与2A间有2条横脉; 后翅长14 mm, 宽3.3 mm, 脉相与前翅极其相似, 只是CuP与1A在基部有一段愈合, 1A与2A间仅1条横脉 (图2)。

雄性外生殖器 (图10~16) 上生殖瓣远长于生殖肢, 淡黄色, 半透明, 与黑褐色的生殖肢颜色形成鲜明对比; 其形状不规则, 上缘、下缘均向内弯曲, 端部密被细长毛, 下缘在中央形成1近圆形的指状短突起, 突起上密被长毛。载肛突上瓣两侧骨化, 中间膜质; 骨片基部宽大, 向两侧外翻, 内侧着生细长毛, 端部窄长, 末端钝圆, 有1簇细长毛; 下瓣短, 基部稍粗, 末端尖细。尾须较短, 仅为生殖肢基节长度之1/3。生殖肢基节半球形, 从后面观在末端中央凹陷成"V"形缺刻, 生殖肢端节很短, 密被细毛, 基部阔, 顶端钝圆, 内缘中间有一突起。阳茎基部宽, 亚基部有圆滑的阳茎叶突, 阳茎丝基部两侧的叶突较短阔, 向内凹, 末端钝圆, 向内或向外折卷, 阳茎丝细长, 缠绕成环。

雌虫 (图9, 17~20) 腹节3~5背板黄褐色, 前缘的前脊沟处呈明显的1条狭窄黑纹, 第6节黑纹更窄, 腹板褐色, 窄长; 第7节背板深褐色, 黑纹消失, 腹板窄长。第8节背板黑色, 短且阔, 两边延长与下生殖板相接, 前缘无明显的前脊沟黑纹痕, 中部浅凹; 下生殖板左右为两瓣, 未愈合, 亚端部具黑色粗毛, 下生殖板侧面观短而阔, 向背部延伸, 与第8、9节背板侧缘相接处颜色加深为黑色, 其它部位深褐色, 气门着生在凹陷的膜质区内; 第9节背板中部黑色, 前缘中部有1浅色圆点, 两侧逐渐变浅, 呈褐色, 两侧前缘与下生殖板背后缘相接; 第10节背板窄, 深褐色, 前缘有极窄的1条黑纹, 两侧刚盖住尾须基部, 未向腹部延伸; 肛上板、肛下板和尾须均为深褐色, 肛上板短于肛下板, 末端圆, 尾须细; 受精丝明显呈管状, 色淡, 开口于中输卵管, 向后延伸变细, 呈浅褐色细丝状, 盘绕在

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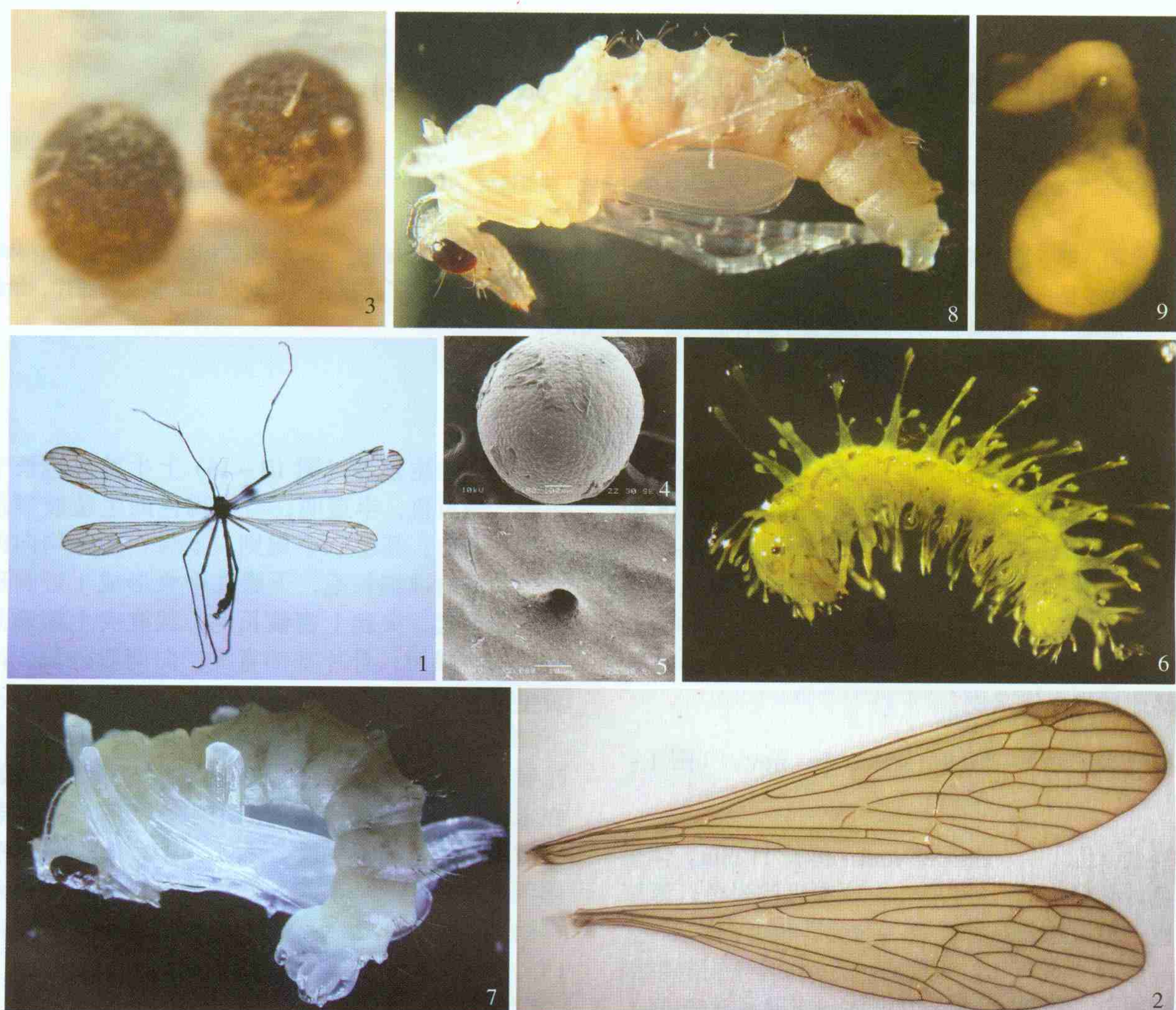


图 1~ 9 周氏蚊蝎蛉, 新种 *Bittacus choui* sp. nov.

1. 成虫 (adult, holotype, ♂) 2. 右翅 (right wings) 3~ 4. 卵 (eggs) 5. 卵孔 (micropyle) 6. 一龄幼虫 (1st instar larva) 7. 雄蛹 (male pupa) 8. 雌蛹 (female pupa) 9. 受精囊 (spermatheca)

受精囊表面, 末端与之相连, 剥去盘绕着受精丝的膜, 可见梨形受精囊 (图 9), 顶端细长、弯曲。

正模 ♂, 陕西省汉中市黎坪国家森林公园大石板, 2005-07-13。副模: 7 ♂♂, 11♀♀, 黎坪国家森林公园大石板, 2005-07-13/16; 2 ♂♂, 1♀, 黎坪国家森林公园黄杨河, 2005-08-13, 谭江丽、蔡立君采, 保存在西北农林科技大学昆虫博物馆。

鉴别特征 根据翅面无斑纹, 新种略类似于秦岭山区的扁蚊蝎蛉 *B. planus* Cheng, 但根据它个体较小, 体呈黑褐色, Pcv 脉 1 条; 上生殖瓣明显长于生殖肢, 形状不规则; 生殖肢端节末端钝圆, 有 1 突起等特征, 容易识别。

词源: 新种谨以周尧教授姓氏 Chou 命名, 以纪念他在我国长翅目昆虫分类中的突出贡献。

生物学 (图 3~ 8) 新种在大巴山一年发生 1 代, 成虫在 7 月初始见, 7 月中旬达到盛期, 8 月下旬为终见期, 采于山阴坡郁闭环境的竹丛中, 整体数量较少。卵深褐色, 近圆球形, 直径约 0.5 mm, 卵壳坚硬, 表面密被小颗粒状突起, 用 10% 次氯酸钠剥去卵的外壳后, 电镜观察到内卵壳表面具多边形沟纹, 观察到圆形卵孔 1 个 (图 5)。卵散产, 在实验室条件下 100 d 左右孵化。幼虫 型, 具复眼和中单眼, 有 3 个龄期, 体背、侧面共有 6 列枝状长刺 (图 6), 照片中的幼虫由于经苦味酸浸泡, 故比正常幼虫颜色偏黄。蛹为强颚离蛹, 从蛹腹部末端的大小可以很容易地区分蛹的性别, 其中雌蛹腹部末端逐渐变细, 雄蛹末端由于有生殖肢而明显较粗。

分布: 大巴山, 位于陕西和四川省的交界。

讨论 不同个体之间, 前翅 1A 与 2A 脉之间的横脉 2 或 3 条不等, 阳茎叶突两侧内凹程度有所不

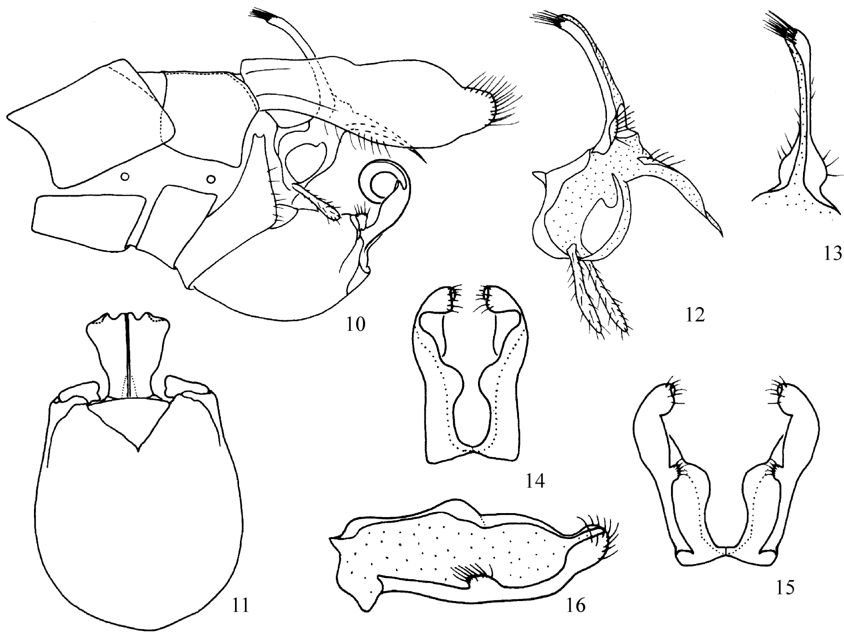


图 10~ 16 周氏蚊蝎蛉, 新种 *Bittacus choui* sp. nov., 雄性外生殖器 (male genitalia)
10. 腹部末端侧面观 (end of abdomen, lateral view) 11. 生殖器腹面观 (genitalia, ventral view) 12. 载肛突 (proctiger with cerci, lateral view) 13. 载肛突上瓣前面观 (upper branch of proctiger, anterior view) 14. 上生殖瓣背面观 (epiandrial appendages, dorsal view) 15. 上生殖瓣腹面观 (ibid, ventral view) 16. 右上生殖瓣内面观 (right epiandrial appendage, inner view)

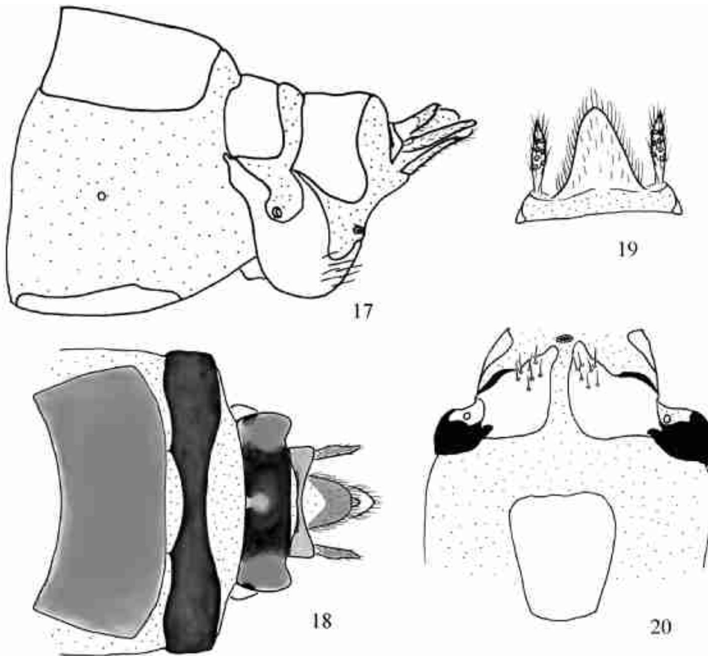


图 17~ 20 周氏蚊蝎蛉, 新种 *Bittacus choui* sp. nov., 雌性腹部末端 (end of female abdomen)
17. 侧面观 (lateral view) 18. 背面观 (dorsal view) 19. 腹节 X 腹面观 (segment X, ventral view) 20. 腹部末端腹面观 (第 10 节除去) (end of abdomen with sternum 10 removed, ventral view)

同, 叶突顶端弯曲程度不一, 有的稍向内折卷, 有的稍向外折卷; 个别后翅亚前缘横脉 2 条 (图 2)。另外, 目前世界已知的 6 种蚊蝎蛉科幼虫 (Setty, 1940) 以及作者 2004 年研究的扁蚊蝎蛉 *B. planus* Cheng, 1949 幼虫均为 4 龄 (未发表资料), 仅新种幼虫为 3 龄。

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A NEW SPECIES OF *BITTACUS* LATREILLE (MECOPTERA, BITTACIDAE) FROM DABA MOUNTAIN IN CHINA

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Abstract A new species of the hangingfly genus *Bittacus* Latreille is described and illustrated from Daba Mountain, Shaanxi Province, China. The type specimens are preserved in the Entomological Museum, Northwest A & F University. Egg, larva, and pupa were obtained through rearing. The seasonality and biology are briefly reported.

Bittacus choui **sp. nov.** (Figs. 1-20)

Male. Body blackish brown; vertex light brown, with a blackish brown marking enclosing ocelli; rostrum light brown. Fore wing: length 16 mm, width 3.9 mm; membrane light yellow without markings; veins brown, 1A terminating far before the level of the fork of M; cubical cross vein a little before the fork of M, no anal cross vein; pterostigma prominent, connected with Rs by one pterostigmal cross vein. Hind wing: length 14mm, width 3.3 mm; similar to fore wings.

Male genitalia. Epiandrial appendages translucent, light yellow, inwardly curved, apex rounded with a few long hairs, the ventral margin medially produced into a round process furnished with long hairs. Basistyle long, blackish brown; dististyle very short, with a rounded tip and a small inner process; aedeagus slender, with greatly coiled elongate filament and a broad rounded lobe at each side of base; upper branch of proctiger sclerotized on each side with middle region membranous, the sclerotized portion broad basally with a few long hairs inside, the rounded apex furnished with a bundle of hairs; the lower branch of proctiger broad basally, narrowed towards apex, membranous except for a narrow sclerotized, setigerous strip on each side.

Female. Terga 3-6 yellowish brown to brown, with narrow black antecostae. Tergum 7 dark brown; moderate length without prominent traces of antecosta. Sternite 7 narrow, brown. Tergum 8 black, very short and broad, without prominent traces of antecosta, anterior margin light emarginated, each side extended, fused to the upper distal margin of the subgenitale. Tergum 9 black in centre with a round pale area on the anterior margin; its lower lateral margin fused to the upper distal margin of the subgenitale by means of a long apodeme. The subgenitale short and broad in lateral view, the centre of upper distal margin deeply concaved where situated a spiracle. The two halves are separated to the very apex by a distinct but very narrow suture. A number of black stiff setae present. Tergum 10 dark brown, with narrowest black antecosta, just cover the cerci, extending a little to the venter. Supraanale, subanale and cerci dark brown; the subanale longer than the supraanale; the subanale lightly acute while the supraanale with its hind margin rounded. Cerci slender of moderate length. Spermatheca pear-shaped.

Holotype ♂, 13 July 2005, Daba Mountain, Shannxi, China, coll. TAN Jiang-Li and CAI Li-Jun. Paratypes: 7 ♂♂, 11♀♀, 13, 16 July 2005, 2 ♂♂, 1♀, 13 Aug. 2005, same data as holotype, preserved at the Entomological Museum, Northwest A & F University.

Biology. *Bittacus choui* sp. nov. completes one generation per year. The adults emerge from early June to late August. The immature stages, including egg, larva, and pupa, have been obtained by rearing. The spherical eggs hatch about 100 days after oviposition. The eruciform larvae uniquely consist of 3 instars, differing from all the other known 4-instar congeners. The pupae are decticous exarate.

Etymology. This species is named in honor of Prof. Chou Io, the founder of the Entomological Museum, Northwest A & F University, for his contribution to the taxonomy of the Chinese Mecoptera.

Diagnosis. Near to *B. planus* Cheng, but separable by smaller in size, body blackish brown, one pterostigmal cross vein; dististyle rounded at tip with a small inner process, epiandrial appendages longer than basistyle.

Key words Mecoptera, Bittacidae, *Bittacus*, biology, new species, China.